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*      MAP 80 SYSTEMS LTD      *  
*      BIOS NOTES             *  
*      CP/M PLUS              *  
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## CP/M PLUS - THE MAP 80 IMPLEMENTATION

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CP/M PLUS has been supplied to you in two parts, a SYSTEM disk which you use to boot CP/M PLUS and a MASTER disk containing the utility files supplied by DRI.

Details of the files provided by DRI can be found in the CP/M PLUS manuals, which, on the whole, will be found instructive and a great improvement over the CP/M 2.2 manuals. We will add a few extra explanations when explaining our implementation in the hopes of clarifying what is a necessarily complex situation.

## HARDWARE REQUIREMENTS

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For systems other than MAP CPU the following mods are required  
G811 with VFC

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Link the G811 to power on reset at 0000H (see G811 manual)  
Link the VFC to auto boot (see VFC manual)

G813 with VFC

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Remove RP/M 2 from the G813 and replace it with BOOT 813 supplied.  
Link the VFC to non-auto boot (see VFC manual)

NASCOM 2 with VFC

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Remove header plug LKS1.  
Set the DIL switches 1234 on LSW1 so that your NASCOM power on resets at 0000H  
Link the VFC to auto boot  
Remove the header from LKS1

## MEMORY REQUIREMENTS

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CP/M PLUS is supplied by DRI in two forms, one for an unbanked system (maximum 64k of memory), and one which operates under a system where more than 64k can be made available. The sophisticated features that CP/M PLUS is capable of requires a lot of memory, and we have therefore only implemented the banked system. However with just one additional bank of 64k the full facilities of a banked CP/M PLUS can be taken advantage of. A Z80 can address 64k of memory using 16 address lines, a system is thus required to access more than 64k. At present 3 systems exist on the NAS/80 BUS, one is a 64k paging system utilised by Gemini, this is quite unusable because CP/M PLUS requires portions of memory to be common (accessible at all times). The second is a 32k paging system available on the MAP RAM card when used with the G811 or Nascom CPU cards, this is very suitable for CP/M PLUS but even better is the 4k memory mapping system which the MAP RAM card also supports and is available when using a MAP CPU or a G813. You will therefore require at least one MAP RAM card and total system memory of at least 128k, the RAM on board the MAP CPU or G813 counts towards this.

## BOOTING

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To boot CP/M PLUS power up your system and then insert your SYSTEM CP/M PLUS diskette in your first floppy drive. A BOOT routine of some sort loads track 0 sector 0 from your master disk. This routine may be the BOOT EPROM on the MAP CPU, or VSOFT on the MAP VFC or varied EPROMs on other systems. The source file 3LDR.MAC, when assembled (3LDR.COM), provides this sector. When 3LDR.COM has been loaded, it is executed and proceeds to load sectors from track 0 sector 1 into memory starting at address 100H. The system loaded is a mini CP/M system (CPMLDR.COM) made up of a mini BDOS, provided by DRI (CPMLDR.REL), and a mini loader BIOS, (assembled from LDRBIOS.MAC). CPMLDR.COM then proceeds to load the main CP/M PLUS system from the first floppy disk, this file resides on the booting disk and is called CPM3.SYS. After CPM3.SYS has been loaded, it is executed, and finally you are into CP/M PLUS. Booting is complete when the CP/M PLUS BIOS loads the console command processor file (CCP.COM) from the last 4k of the system tracks of the SYSTEM disk. CCP.COM is stored in memory, and then loaded and executed to enable command entry. You will be greeted with the CP/M prompt A>

## BOOTING ERRORS

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If you insert a diskette which has not had the system tracks initialised with a valid system the message SYSTEM? will appear. Insert a properly initialised diskette and booting will then take place (It may be necessary to RESET your machine).

If the boot routine is unable to read a sector from the system track (most likely due to physical damage to the diskette) then the message ERROR will be displayed. Replace the offender with a properly initialised diskette and press RESET.

## ON SCREEN EDITING

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The normal cursor when the BIOS is calling for console input is a blinking underline character, when console input is not being called for the cursor remains visible but is non-blinking. The MAP BIOS provides an additional feature i.e on screen editing.

To enter the edit mode press EDIT ^ or (^SHIFT@ Nascom keyboards) to obtain an entry of 00H. This informs the BIOS to enter edit mode 1. In this mode the cursor will change to a non-blinking block key entries will be echoed to the screen but will not be returned to CP/M.

The cursor control and screen edit keys may be used at will. When CR is pressed the entire current cursor line, with some exceptions, is returned to CP/M. Exceptions are:

- 1) Trailing blank spaces.
- 2) CP/M utility prompts \*,f,-,: and . when they occur in the first column
- 3) The CP/M prompt A> when > occurs in the second, third or fourth columns.

After returning the line the BIOS returns to non-edit mode, unless whilst in edit mode 1 the edit key is pressed a second time. Then the cursor will change to a blinking block and the BIOS will keep returning to the edit mode until the edit key is pressed again. Note that the entire line is returned which means that the edit mode may be unsuitable within some programs. It should also be noted that some editing features are not available on NASCOM 1 keyboards.

## DISK ERROR MESSAGES

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The BIOS traps and displays disk errors which may occur whilst attempting to read or write a sector. This error could occur, for instance, by inserting a disk the wrong way, attempting to write to disk with a write protect tab fitted, forgetting to close the drive door, forgetting to insert a disk or because of disk damage. Having displayed the error you will be prompted for retry, if the problem is a write protect tab fitted or non-inserted disk etc. you may cure the problem and continue, by pressing Y, without the BDOS or user program knowing anything untoward has happened, if the problem is more serious e.g a damaged disk press N and you will be returned to the BDOS which will process the error and pass it to the user program as necessary.

## POSSIBLE ERROR MESSAGES

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### Not Ready

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Occurs if a drive door is open or there is no disk, or an unformatted disk.

### Disk Write Protected

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Occurs when an attempt is made to write to a diskette which has a write protect tab fitted.

### Write Fault

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This is a fault signal provided by a drive. Drives supplied by MAP 80 do not provide this signal so this fault should never occur.

### Record not found

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This fault occurs if the FDC has been unable to find a sector's address header or unable to find a sector's data marker. Retries are unlikely to cure this error. If it should occur copy as much information as possible off the offending diskette and reformat it. If the error persists the diskette will most likely have been subject to physical damage and is best discarded (or returned to your supplier if new).

### CRC Error

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This error occurs when a sector has been found and loaded but a checksum shows that it is corrupt. Again retries are unlikely to resolve this but, as it is at least possible to load the sector, it may be possible to edit it with for example DDT to recover the data.

## DEVICE INPUT/OUTPUT

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CP/M PLUS exercises IO via CONSOLE (in and out), AUXILLARY (in and out), and LIST (out). These IO systems can be assigned none, one or more of up to 16 devices.